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ABSTRACT

The need to provide an improved science and mathematics curriculum is imperative. Over recent years cognitive psychologists and educators have responded to this need by designing instructional programs that are more compatible with our knowledge of how people acquire, use, and retain knowledge. This book contains many of the guiding principles that underlie these programs. The following chapters and authors are presented: (1) "A Cognitive Approach to Improving Thinking Skills in the Sciences and Mathematics" (Diane Halpern); (2) "The Jasper Series: An Experiment with New Ways to Enhance Mathematical Thinking" (James Van Haneghan, Linda Barron, Michael Young, Susan Williams, Nancy Vye, and John Bransford); (3) "Mathematical and Scientific Thinking in Classrooms and Other Situations" (James Greeno); (4) "Expert Knowledge and Processes of Thinking" (Robert Glaser); (5) "Enhancing Higher-Order Thinking Skills in Physics" (Jose P. Mestre, Robert J. Dufresne, William J. Gerace, Pamela T. Hardiman, and Jerold S. Tougher); (6) "Teaching of Thinking Skills in the Sciences and Mathematics," (Richard Mayer); and (7) "Cognitive Research on Thinking in Academic Science and Mathematics: Implications for Practice and Policy," (Audrey B. Champagne). (ZWH)

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